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ADENO-MYOMA UTERI DIFFUSUM BENIGNUM.

BY

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Glandular elements in myomata of the uterus are not at all infrequent, and numerous cases have been reported. There is a difference of opinion as to the source of the glands, some believing that they originate from remains of the Wolffian body, others that they are due to down-growths from the uterine mucosa. In the majority of the reported cases the adeno-myomata have been situated in the uterine muscle at some distance from the mucosa, or have been subperitoneal.

From these cases one has only been able to deduce theories as to the origin of the glands, but has not been in a position to make any definite statement.

In this article I propose briefly discussing a variety of adeno-myomata which is diffuse in character, is situated in the inner layers of the uterine wall, and which is dependent on the uterine mucosa for its glandular elements.

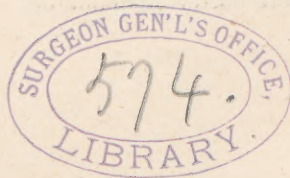
Tumors of this nature have been mentioned by Rokitansky, Schatz, and Schröder, and Diesterweg reports a case which was probably of this character. v. Recklinghausen, in the "Nachtrag" accompanying his recent work, "Die Adenomyome und Cystadenome der Uterus- und Tubenwandung," carefully depicts a case belonging to this group.

In March, 1895, I reported a like case before the Johns Hopkins Medical Society, and one month later received another such specimen from the operating room. The accompanying is a detailed account of these two cases.

CASE I.

Adeno-myoma uteri diffusum benignum. Glandular uterine polyp in cervix. Small interstitial and subperitoneal myomata. (Plates I and III.*)*

L. W., admitted in the service of Dr. Kelly, October 24th, 1894, æt. 46, single.



Her complaint on admission—pain in lower part of abdomen, painful and profuse menstruation. Menstruation commenced when she was eleven years of age, and was always regular. For the past ten years she has had severe pains in the right ovarian region at the menstrual period. These pains radiated down both limbs, were accompanied by back-ache, and for the last two years have been so severe that she has been confined to bed for three to four days at each period. At present the flow lasts from ten days to two weeks, and there is a considerable amount of clotted blood. Her last period ceased one week before admission. Her parents are both living and healthy. One brother died of tuberculosis. With the exception of an attack of diphtheria several years ago and influenza three years ago, she has always been well.

Present condition. The patient is a rather anæmic woman and does not appear to be very strong. Her tongue is pale and flabby, appetite fair, bowels regular. She is unable to walk much and cannot lift heavy weights. *Vaginal examination.* The outlet is very much relaxed, and presenting at the orifice is a hard, irregular mass, which proves to be the cervix. The external os is patulous, admitting the index finger, and projecting from the os is what appears to be a myomatous nodule about the size of a hazelnut. The cone-shaped cervix is continuous with the enlarged uterus, which is apparently freely movable.

Clinical diagnosis. Myoma.

Operation by Dr. Kelly, Oct. 31st, 1894. On opening the abdomen it was found impossible to raise the uterus out of the pelvis, and the operator was compelled to work in the narrow space between the uterus and the pelvic walls. The ovarian and uterine vessels on both sides were controlled and the uterus amputated. The lips of the stump were then brought together, and, lastly, the peritoneum from the posterior wall sutured to that of the anterior, thereby completely covering over the stump. The patient made an uninterrupted recovery, and was discharged December 1st.

PATHOLOGICAL REPORT (No. 497). SEE PLATE I*.

The specimen consists of the enlarged uterus with its tubes and ovaries intact. The uterus is 13 cm. long, 12 cm. broad, and 10 cm. in its antero-posterior diameter. It is approximately globular,

and in its contour resembles a normal but enlarged uterus. Anteriorly it is smooth and glistening, posteriorly over its lower two-thirds it is denuded of peritoneum. Situated in the posterior wall in the vicinity of the left uterine cornu are four sessile nodules, which are approximately circular. The largest of these is 2 cm. in diameter. On section they are whitish in color and are composed of fibres concentrically arranged. They present the usual myomatous picture. The undercut surface of the uterus is 12 x 11 cm. In the centre of this is the cervical opening, which is 1 cm. in diameter. Projecting from the right side of this opening is a nodule 2.5 cm. in diameter; this is apparently covered by mucous membrane which is somewhat hemorrhagic.

The anterior uterine wall is 7 cm. in thickness (Plate I); it can be divided into two distinct portions: an outer, 1 cm. thick, which resembles normal uterine muscle; the remainder of the wall presents a coarsely striated appearance, the striae running in all directions.* Scattered throughout this thickened and striated portion of the uterine wall are round, oval or elongate brownish yellow homogeneous areas, some of which merge directly into the uterine mucosa. In one or two places small cysts, varying from 1 to 4 mm., can be seen scattered throughout this thickened portion of the uterine wall. The striated appearance can be traced directly up to the uterine mucosa, and in some places into it. After hardening the specimen in Müller's fluid the contrast between the normal uterine muscle and the thickened striated portion is very sharp, the uterine muscle being much darker in color than the striated portion. The posterior wall of the uterus varies from 2.5 to 3.5 cm. in thickness. It is rather dense, but does not present any coarse striation. Situated in the posterior wall are two interstitial nodules 1 and 1.5 cm. in diameter; they are pearly white in color and are composed of concentrically arranged fibres.

The uterine cavity is 7.5 cm. in length, and at the upper part 8 cm. in breadth. The mucous membrane of the anterior uterine wall varies from 7 to 8 mm. in thickness, is yellowish white in color, smooth and glistening. In many places, however, it presents ecchymoses in the superficial portions. In the vicinity of the internal os and extending upward for about 2.5 cm. are three or four longitudinal folds of the mucosa. The depressions between

these are about 4 or 5 mm. in depth. The mucosa covering the posterior wall varies from 3 to 4 mm. in thickness.

Right side. The tube is 11 cm. long, averages 7 mm. in diameter. Its fimbriated extremity is patent; the parovarium is intact. The ovary is 8 x 2.5 x 1.5 cm., is pale white in color, smooth and glistening. It contains two corpora lutea, the larger of which is 2.5 cm. in diameter.

Left side. The tube is 9 cm. long and 6 mm. in diameter. Its extremity is patent; the parovarium is intact. The ovary is 4 x 4 x 1 cm., is yellowish white in color and somewhat lobulated. It contains a cyst 2.5 cm. in diameter. The walls of this are 2 mm. in thickness, and the inner surface is dirty brown in color.

HISTOLOGICAL EXAMINATION.

The nodule projecting into the uterine canal (Plate I*) is composed of non-stripped muscle fibres. Its outer surface is in places covered by cylindrical epithelium, but in most places apparently by several layers of spindle-shaped connective tissue-like cells. Scattered everywhere throughout this muscle are gland-like spaces varying from a pin-point to 3 mm. in diameter. These are lined by one layer of epithelium, which in the smaller glands is of a high cylindrical variety. In the dilated glands, however, it is cuboidal, or has become almost flat. The protoplasm of the cells takes the hematoxylin stain. The nuclei are oval and vesicular, and in many places it is possible to make out the cilia. The glands are empty or contain a granular material that takes the hematoxylin stain. These glands resemble to some extent those of the cervix. The surface of the mucosa covering the anterior uterine wall presents in places a wavy outline (Plate III*, Fig. 1). Its epithelium is of the high cylindrical variety and is everywhere intact. In a few places it is swollen and somewhat flattened. The glands are moderate in number, are small and round on cross section, and have an intact epithelium. A few of them are slightly dilated and contain desquamated epithelium. The glands may be traced from 7 to 10 mm. before any muscular substance is encountered; they then end abruptly or continue into the muscle, where they can in places be traced for at least 1 cm.; this down-growth is visible in many places. The stroma of the mucosa is

composed of cells whose nuclei vary from oval vesicular, as seen near the surface, to deeply staining ones, as noticed in the depth of the mucosa. In some places the stroma cells have elongate oval nuclei, and it is impossible to distinguish these from muscle fibres. The superficial portions of the stroma show marked hemorrhage which is localized to certain areas. The stroma as a whole does not appear to be very vascular.

The thickened and striated portion of the anterior uterine wall is composed of non-striated muscle fibres, which are for the most part cut longitudinally. The fibres run in all directions, are closely packed together, but are only in a few places concentrically arranged. Scattered throughout this tissue are numerous cells having small, round, deeply staining nuclei which resemble those of lymphoid cells. Under the microscope it is impossible to tell where the coarsely thickened zone ends and the normal uterine muscle commences, the transition of the one into the other being so gradual. Traversing this thickened portion of the uterine wall are small clusters of glands, precisely similar to those of the uterine mucosa (Plate III*, Figs. 1, 2). These glands are round or oval and are lined by one layer of cylindrical ciliated epithelium. A few longitudinal sections of the glands are here and there visible. Some of the glands are dilated, one of them reaching 5 mm. in diameter. The epithelium of the dilated glands is in places somewhat flattened or has entirely disappeared.

In one place two glands are seen opening into a dilated gland. Nearly all of the glands are surrounded by stroma similar to that of the uterine mucosa. A small isolated gland is occasionally found lying directly between the muscle fibres, and a few of the cysts have no stroma surrounding them. *The gland invasion can be traced to the point where the coarsely striated tissue joins the uterine muscle.* They are most abundant near the uterine mucosa, and gradually diminish as one passes outward. They may be scattered anywhere throughout the myomatous growth, but appear for the most part to occupy the spaces between the muscle bundles. In few places can any concentric arrangement of muscle fibres be made out around the glands. The glands themselves show no evidence of degeneration.

From the above it will be seen that there is a diffuse muscle

thickening of the anterior uterine wall, and that there is a down-growth of normal uterine glands into the newly formed muscle. Along the lower margin of the growth is a typical myomatous nodule 5 mm. in diameter.

The mucosa covering the posterior uterine wall is normal.

The right tube and ovary are normal.

The left tube is normal. The small cyst of the left ovary has no epithelial lining, hence its exact origin cannot be ascertained.

CASE II.

Adeno-myoma uteri diffusum benignum. Small interstitial myoma. Normal appendages.

K. B. N., married, æt. 40. Admitted to service of Dr. Kelly, April 3d, 1895. Complaint on admission—painful and profuse menstruation. The patient began to menstruate when fourteen years of age. The periods occurred at intervals of from three to four weeks, were profuse, but not accompanied by much pain. She has been married seventeen years; had one difficult but non-instrumental labor sixteen years ago, after which she was confined to bed for six weeks on account of chills and fever, which were followed by abdominal pains. Eleven years ago she had a miscarriage. Immediately after the birth of the child the menses became very profuse for a time, and then diminished in amount. Five years ago the menses again became profuse and there was discharge of dark clotted blood. Pain was felt in the lower abdomen, also in the back. It commenced a few hours before the flow and lasted until the menses were over. The patient has never been strong; when twelve years of age had malaria, and when fifteen, pneumonia. Her family history on both sides is decidedly tuberculous, both grandfathers, her mother, one aunt and two cousins dying of phthisis.

Present condition. The patient is a well nourished but rather anæmic woman, weighing 140 lbs. Her tongue is coated, appetite good. She has an occasional headache; experiences no difficulty in locomotion; her feet and ankles occasionally swell; urine normal; last menses ceased two weeks ago, duration ten days. On vaginal examination myoma uteri was diagnosed.

April 6th, 1895. Operation by Dr. Kelly. An incision 15 cm. long was made in the median line, and the tumor lifted out of the pelvis. The ovarian vessels, round ligaments and uterine vessels were tied and the uterus amputated low down. The cervical lips were then brought together, and the peritoneum from posterior pelvic wall united with that from the anterior. Patient was discharged May 3 feeling perfectly well.

PATHOLOGICAL REPORT (No. 661).

The specimen consists of the enlarged uterus with its appendages intact. The uterus is pear-shaped and measures 12 cm. in length, 10 cm. in breadth and 8 cm. in thickness. It is pinkish in color, smooth and glistening. 2 cm. of the cervical canal is present; its mucosa is pearly white in color, smooth and glistening; and has almost entirely lost its rugous appearance. The uterine cavity measures 4.5 cm. in length and is 5.5 cm. in breadth in its upper portion. The posterior wall bulges slightly into the cavity. The mucous membrane is smooth, but presents a mottled appearance, being the seat of extensive hemorrhage. It is 8 mm. in thickness. The anterior uterine wall averages 2.5 cm. in thickness. *The posterior wall is 5 cm. thick and may be divided into two portions: an inner and thickened, which is coarsely striated and which looks very much like myomatous tissue; and an outer, resembling normal uterine muscle.* The contrast is much sharper after the specimen has been hardened in Müller's fluid, the coarsely striated portion staining lightly, the normal muscle deeply. On careful examination of the hardened specimen, greyish brown granular areas are seen scattered throughout the thickened portion of the wall. These are round or irregular in contour, and as one approaches the uterine cavity are seen to merge directly into the mucosa. Even on macroscopical examination it is evident that at least the superficial areas are portions of the mucosa that dip down into the tumor.

Scattered here and there throughout the tumor are cavities, the largest of which is about 5 mm. in diameter. They have a smooth, glistening inner surface. Some of them are filled with blood. Along one margin of the tumor is a myomatous nodule 1 cm. in diameter. The outer portion of the uterine wall, which corresponds to the uterine muscle, averages 1 cm. in thickness.

Right side. The tube is 9 cm. long, 6 mm. in diameter. It is free from adhesions and has a patent fimbriated extremity. The parovarium is intact. The ovary is 3.5 x 2.5 x 0.8 cm. It is free from adhesions, and on its under surface contains two slightly dilated Graafian follicles.

Left side. The tube is 7 cm. long and is 0.8 cm. in diameter. It is free from adhesions and has a patent fimbriated extremity. The parovarium is intact.

The ovary is 3.5 x 2.5 x 0.5 cm. and is slightly cirrhotic. On its under surface is a corpus luteum 2.5 x 1 cm.

HISTOLOGICAL EXAMINATION.

The cervical glands are in most places normal, but have here and there proliferated. The epithelium covering the surface of the cervical mucosa is of the high cylindrical variety; near the junction of the internal os, however, it suddenly changes and the mucosa is covered by several layers of squamous epithelium. Above this point the typical cervical epithelium is again found. The mucosa covering the posterior wall of the uterus has an intact surface epithelium. Here and there little knob-like masses of the mucosa project into the uterine cavity. The uterine glands in the superficial portions are moderate in number and are small and round on cross section. In the deeper portions they show considerable branching, and in some places it looks as if one gland sent off three or four branches; this appearance we believe is due to marked convolution of the glands. *In several places the glands are seen extending down into the underlying tumor.* This is most noticeable near the upper part of the uterine cavity, where longitudinal sections of two or three glands can be seen passing between muscle bundles into the depth of the tumor. This is clearly demonstrable to the naked eye. The stroma of the mucosa is rarefied.

The individual stroma cells have oval vesicular nuclei and are slightly swollen. Scattered here and there throughout the stroma are small, round cells, occurring either singly or in clumps. The superficial portions of the mucosa show considerable hemorrhage. The coarsely striated thickening in the posterior uterine wall is composed of non-striated muscle fibres which are cut both longitudinally and transversely. This tissue is denser than normal

uterine muscle, but otherwise closely resembles it. Between the bundles of muscle fibres, and also between the individual fibres, there is considerable small, round-celled infiltration. *Scattered freely throughout the tumor are glands.* The majority of these are found in groups; some, however, occur singly. These glands are in many places seen on cross section, where they appear as rows of oval or round glands. Some have been cut longitudinally and are cylindrical, others are curved. A few appear to have secondary glands opening into them. The glands as a whole are lined by one layer of cylindrical epithelium on which it is possible in many places to make out cilia. A few of them are dilated. The epithelium of part of these is intact, in others it has become flattened or has disappeared. Some of the dilated glands are empty, others contain desquamated epithelium and granular material. Some of the desquamated cells are swollen and their protoplasm contains yellowish brown granular pigment.

The largest gland is filled with blood. In many of the glands the epithelium has become desquamated, and the gland is only recognized as a space partially or completely filled with desquamated cells. The groups of glands, and also most of those occurring singly, are surrounded by stroma which separates them from the muscle. This stroma is similar to that of the normal uterine mucosa. Here and there cross sections of three or four glands are seen where the epithelial cells lie directly in contact with the muscle. In a good many places stroma cells contain brown granular pigment. At one or two points a very curious picture is visible: at one end of a space between muscle bundles it is possible to make out a gland undergoing degeneration, on tracing this a little further we see three oval spaces forming a chain; these are almost completely filled with small, round cells and cells having oval vesicular nuclei which look a little like those of epithelioid cells. Each of these masses of cells contains one or more giant cells, which are round, oval or elongate oval; their nuclei are vesicular and situated in the centre of the cell or around the periphery. They remind one somewhat of tubercles, but we believe them to be degenerate glands. We were unable to detect tubercle bacilli in these areas, furthermore there is no caseation. There is no definite arrangement of the muscle around the bunches

of glands. It looks as if the glands just filled in the spaces between muscle bundles. At one side of this new growth is a typical myomatous nodule 1 cm. in diameter; this is entirely devoid of gland elements. The outer zone of the posterior wall, consisting of uterine muscle, is normal. The mucosa covering the anterior uterine wall is normal. Both tubes and ovaries are normal.

Since the above cases were examined the following specimen has been obtained from the operating room. It does not belong to this group of cases, but may well be considered here.

CASE III.

Diffuse myomatous thickening of the uterine wall. Interstitial uterine myoma. Hemorrhage into and thickening of the uterine mucosa. Inclusion of uterine glands between myomatous masses. General pelvic peritonitis. (Plate II.)*

Right side. Perisalpingitis and perioöphoritis.

Left side. Perioöphoritis.

Mrs. D. G., æt. 43, white. Admitted in the service of Dr. Kelly, June 29, 1895. Complaint—pain in the lower part of the abdomen, profuse and painful menstruation. She has been married twenty-five years, but has never been pregnant. Menstruation began during the sixteenth year and continued to be regular until five years ago. It has always been free, and at times painful. Her family history is negative. At seventeen years of age she had typhoid fever, also meningitis. Her health since then has been poor. Her present illness dates back five years. At this time she passed several dark pear-shaped masses per vaginam. These appeared to be covered by a thin membrane, and their passage was accompanied by intense paroxysms of pain. After this, menstruation became irregular and very profuse, lasting sometimes two weeks. The discharge was very dark in color and frequently clotted. About the second day of menstruation severe pain would commence. This would last throughout the period, and has at

times been so severe that it was necessary to keep her under the influence of chloroform. Last period was four weeks ago, and the one before that six months previous. Four years ago she noticed a tumor in the lower part of the abdomen. This was freely movable. January, 1894, an exploratory section was made in an adjoining State; nothing was done, as the case was supposed to be malignant. After the operation the abdominal pain diminished and the patient's health improved.

Present condition. Patient is an emaciated, anæmic-looking woman. Her tongue is clean, bowels constipated. She has a

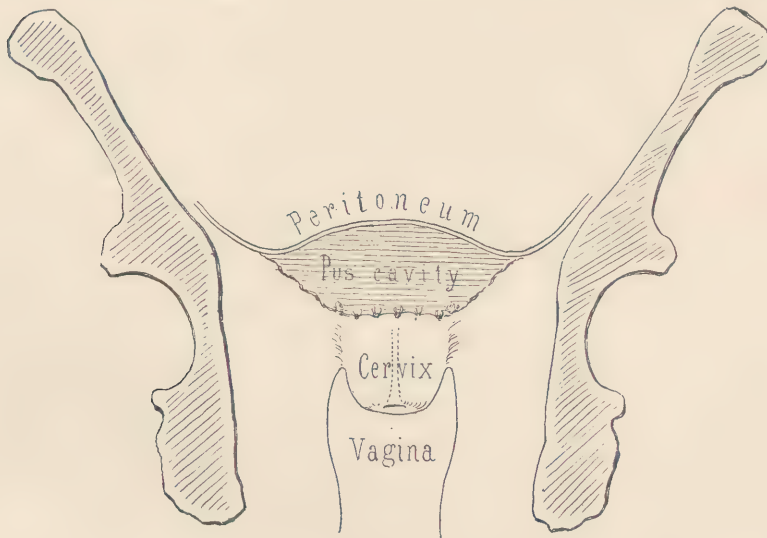


Fig. I.

Represents a section through the pelvis. The peritoneum is pushed upward, and the space between it and the cervical stump is the seat of a collection of pus.

watery discharge that has persisted for the last four years. This is slightly offensive and varies considerably in color; at times it is yellow, at other times has a greenish tinge. It is often tinged with blood, and is profuse. Menstruation is frequent and at times painful, and during recent years there has been sensation of weight and pain in the region of the rectum. Locomotion and exercise occasion a good deal of pain in the lower abdomen. Abdominal pressure does not, however, cause any discomfort.

July 1st, 1895. Operation by Dr. Kelly. An incision 20 cm. in length was made in the anterior abdominal wall, and the old scar was dissected out. In making this incision care was taken to avoid as far as possible the dense adhesions between the anterior abdominal wall and the uterus. After breaking up numerous adhesions to the anterior abdominal wall the uterus could be lifted up. The left ovarian and uterine vessels were controlled and the uterus pulled toward the right side. It was then amputated at

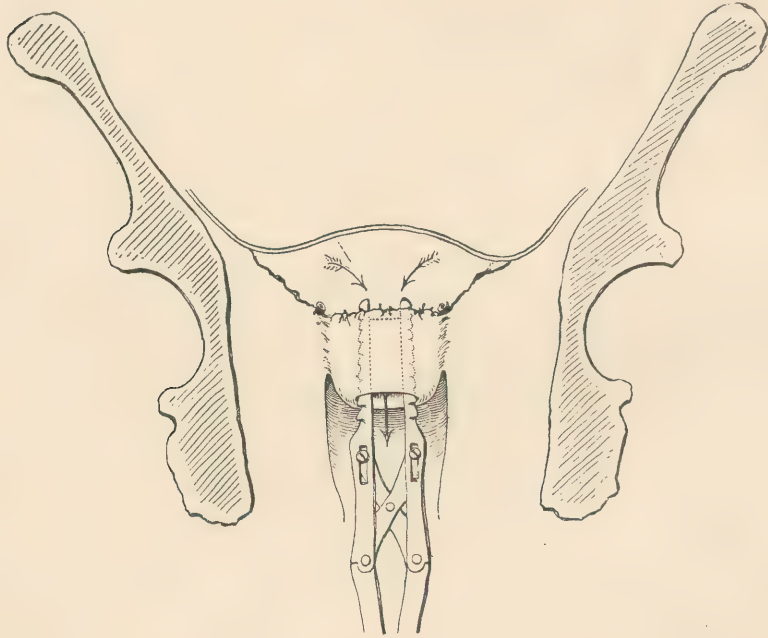


Fig. II.

Shows the method pursued in evacuating the pus cavity seen in Fig. I. The dilator has been introduced into the cervix and the canal stretched. One or two sutures of the cervical stump are torn out, thus establishing free communication between the pus cavity and the vagina.

the cervix, and the vessels on the opposite side were controlled. The abdominal cavity was thoroughly washed out with 1 litre of normal salt solution, pure carbolic was applied to the cervical canal, and a small gauze drain laid in the canal. The lower end of this was drawn down into the vagina, so that any secretion that might

form would pass off per vaginam. The cervical stump was then closed, and the pelvic peritoneum from the anterior wall united with that from the posterior wall, thus completely hiding the stump. The fascia in the abdominal wall had to be dissected out of its bed of scar tissue to allow of the proper approximation. The fasciæ were brought together by mattress sutures of silver wire, and the superficial portions closed in the usual manner.

On the second day the temperature rose to 100.6° ; on the morning of the third it had fallen to 99° , but on the evening of the same day it reached 100.4° ; for several days it ranged from 100° to 101° , and on July 13th was 102° . On July 15th the cervix was dilated and about 70 cc. of pus escaped (see Figs. 1 and 2). On the 25th the temperature reached normal, and August 12th the patient was discharged, feeling perfectly well.

The abdominal wound in this case broke down and discharged for a few days, but on July 20th had healed completely.

PATHOLOGICAL REPORT (No. 788).

The specimen consists of the uterus with intact appendages. The uterus is 11 x 9 x 9 cm. in its various diameters. It is more globular than usual. Anteriorly and posteriorly it is covered by dense adhesions. The undercut surface, which corresponds to the point of amputation, is 4 cm. in diameter. On section 1.5 cm. of the cervix is seen. The mucosa of this is smooth and glistening. The uterine walls are greatly thickened, varying from 2.5 to 4.5 cm. in thickness. The wall may be divided into two distinct layers: an inner, which is coarse in texture, and an outer, resembling normal uterine muscle. In the anterior uterine wall the inner layer is 2 cm. in breadth and presents a coarsely fibrillated appearance. It is fairly sharply defined from the outer layer, which averages a little more than 1 cm. in thickness. The distinction between the two layers is best seen in the hardened specimen, the normal muscle being much darker in color. The posterior wall (Plate II*) varies from 4 to 5 cm. in thickness. It is also divisible into two portions: an inner, consisting of coarsely arranged fibres, and an outer, resembling normal uterine muscle. In some places this coarse arrangement of the muscle reaches almost to the peritoneal surface. Situated in the fundus is an irregularly globular

tumor 9 cm. in diameter. This on cross section presents the typical picture of myoma; some portions of it are whitish yellow in color, are soft, and apparently have undergone degeneration. The uterine cavity is 6 cm. in length and 6 cm. in breadth at the fundus. Its mucosa is bluish red in color, and in the upper portion of the cavity is gathered up into irregular mounds varying from 1 to 3 cm. in diameter. These project from 1 to 8 mm. into the uterine cavity. The surface of the mucosa over most of these nodules is smooth and glistening, but here and there it presents a rough, worm-eaten appearance. In the uppermost parts of the cavity the mucosa covering the anterior wall is intimately connected with that covering the posterior wall, there being numerous adhesions passing from one surface to the other. The uterine mucosa varies from 1 to 7 mm. in thickness. At one point in the anterior wall, and high up in the cavity, the mucosa appears to have penetrated the uterine muscle, an oval area of the mucosa being seen 7 mm. in the depth of the muscle. This area is 1 x 0.6 cm. in diameter and is sharply defined. In the posterior wall, corresponding to the lower part of the myomatous nodule, the mucosa penetrates the muscle for a distance of 1.5 to 2 cm. (Plate II*).

Right side. The tube is 8 cm. in length, averages 5 mm. in diameter. After passing outward a short distance it curves backward, and is densely adherent to the posterior surface of the uterus. Its fimbriated extremity is patent. The parovarium is intact. The ovary is 2.5 x 2.5 x 1 cm. It is covered by a few delicate adhesions and contains a Graafian follicle 1.7 cm. in diameter.

Left side. The tube is 7 cm. in length and averages 0.5 cm. in thickness. It is free from adhesions and has a patent fimbriated extremity. The parovarium is intact. The ovary is 3.5 x 2.5 x 1.5 cm. It is covered by delicate non-vascular adhesions, and the greater part of the ovary is converted into a cyst 2.5 x 1.5 cm.

HISTOLOGICAL EXAMINATION.

The epithelium covering the cervical mucosa is intact and the cervical glands are normal. Along the outer cut surface of the cervix in the vicinity of the broad ligament are two glands lined by cylindrical epithelium. They cannot be distinguished from uterine glands, and are surrounded by a small amount of stroma similar

to that of the uterine mucosa. The uterine mucosa has an intact surface epithelium. Its glands are very abundant. In the superficial portions they are small and round on cross section, but in the deeper portions, and especially in the vicinity of the muscle, they are considerably dilated. The gland epithelium is everywhere intact, even where the glands are dilated. The gland cavities are either empty or contain swollen, desquamated epithelial cells or blood. A few contain polymorphonuclear leucocytes. The stroma of the mucosa is of the usual density; its individual cells have the characteristic oval vesicular nuclei. The stroma is especially rich in delicate blood-vessels, which have but an endothelial lining separating them from the stroma cells. These vessels are dilated and contain large quantities of polymorphonuclear leucocytes. Scattered throughout the superficial portions of the stroma are many small, round cells and a few polymorphonuclear leucocytes. There is also considerable hemorrhage into the superficial portions of the mucosa. Where the mucosa is gathered up into folds or little dome-like masses, its surface is likewise covered by cylindrical epithelium. Many of the glands are dilated, and the epithelium of these has become cuboidal. The stroma in these thickened areas is markedly infiltrated by blood. At the point where the round bunch of glands was seen in the muscle they are found to be perfectly normal. They resemble identically those seen throughout the mucosa, and are surrounded by normal stroma.

On examining the glands seen dipping down into the muscle to a depth of 2 cm. they are found to be nothing more than a continuation downward of the normal glands, which are accompanied by the usual amount of stroma. These glands are dilated. The epithelium of those in the deeper portions is lying free in the cavity of the glands and appears to be somewhat degenerated. It looks as if the glands in the deeper portions were being pressed out of existence by the growth of the myoma. The uterine glands wherever found are, apart from the occasional dilatation, perfectly normal and do not show the least tendency to become malignant. The thickened portions of the uterine wall are composed of bundles of non-striped muscle fibres cut longitudinally and transversely. They have a rich blood supply and present the usual myomatous appearance. The large circumscribed nodule situated in the fun-

dus is also composed of non-striped muscle fibres cut in various directions. The tissue throughout has undergone considerable hyaline degeneration, and where the softening was noticed muscle fibres have practically disappeared. Where the degeneration is most advanced the hyaline material has melted away, leaving small spaces.

The apparent extension of the uterine mucosa into the muscle can be very easily explained on mechanical grounds, and is probably no extension at all. It looks as if the myomatous thickening had taken place on each side of the point where the glands appear to project downward. The newly formed myomata have encroached upon the uterine cavity, leaving the mucosa in the depression between them.

Right side. The tube is normal. The ovary has a normal stroma, contains a Graafian follicle 1.5 cm. in diameter, and has scattered throughout it numerous corpora fibrosa.

Left side. The tube is also normal. The ovary is covered by a few adhesions, but otherwise presents the usual appearance.

GROSS APPEARANCE OF THE DIFFUSE ADENO-MYOMATA.

The uterus may be pear-shaped or resemble a normal but enlarged uterus; projecting from the surface will probably be a few subperitoneal myomatous nodules. Section of the uterus shows that one wall is much thickened. This thickening occurs in the inner zone, namely, between the mucosa and uterine muscle. The thickened zone resembles a myomatous growth, but the coarse glistening bands, instead of forming a definite nodule, intertwine one with the other, producing a coarse and dense network. The cut surface of this growth gives, as v. Recklinghausen points out, the watered silk appearance. The diffuse growth as a whole is much paler than the outer covering of the uterine muscle, but at the point of junction one merges gradually into the other, and there is little difference in color. There is not the sharp outline which the ordinary myoma presents. After hardening in Müller's fluid the contrast between the normal muscle and the new growth is much sharper.

The uterine mucosa covering the inner surface of this diffuse growth does not show the marked convexity seen in submucous

myomata. The surface is perfectly smooth or presents a slightly wavy outline. The mucosa in our cases was a little thicker than usual, but the individual elements were normal. At numerous points the mucosa can be seen penetrating into the depth between the muscle bundles. In places it will be possible to trace this down-growth of the mucosa for 1 cm. or more into the muscle.

Scattered freely throughout the growth are small, triangular, crescentic or irregular islands of tissue, which in color and consistence resemble the mucosa. These are slightly granular and in many places contain small cysts. A few of these cysts reach 5 mm. or more in diameter. The inner surfaces of these cysts have a smooth lining resembling mucous membrane. The cavities of some are filled with blood. Even macroscopically one sees that the superficial islands at least are down-growths of the uterine mucosa.

Small myomata will be found scattered throughout the uterine wall, especially in the vicinity of the diffuse growth.

MICROSCOPICAL APPEARANCES.

It will be well to study a section taking in the entire uterine wall, commencing at the uterine mucosa and extending to the peritoneal surface (Plate III*, Fig. 1).

The surface epithelium of the mucosa is intact. The glands present the usual appearance, being cylindrical. In the deeper portions they may be somewhat convoluted. The diffuse thickening is composed of non-striped muscle bundles which run in all directions. They occur as long bands of fibres, which follow a straight or serpiginous course and do not show much tendency to arrange themselves concentrically as in ordinary myomata. This new growth throughout may show small round-celled infiltration. At numerous points the longitudinal glands are seen penetrating the growth for a distance of 1 cm. or more. These glands present exactly the same appearance as those on the surface of the mucosa, and are accompanied by the characteristic stroma of the mucosa. The small, irregular islands of homogeneous tissue seen scattered throughout the tumor are composed of glands with their accompanying stroma. The glands may be small and round, as seen on cross section, or be cut lengthwise, showing a typical cylindrical outline.

Sometimes they are curved, forming a half-circle. In a few places branchings may be noticed. The glands are lined by one layer of cylindrical epithelium, on which it is frequently possible to distinguish the cilia.

The gland cavities are empty or contain a small amount of granular material. The small cyst-like spaces, seen macroscopically, are dilated glands. The epithelium of some of these is intact, that of others is flattened or has entirely disappeared. Some of the cyst cavities are empty, others contain desquamated epithelium which may have taken up light brown granular pigment; a few are filled with blood. The stroma surrounding these glands resembles identically that of the uterine mucosa. In places it shows some hemorrhages, in other parts its cells have taken up yellowish brown granular blood pigment. Scattered here and there throughout the growth is a small gland, or a row of glands, devoid of stroma, and lying directly between muscle bundles. The glands are most abundant near the uterine mucosa, diminish in number as one passes outward, and in the normal uterine muscle are entirely wanting.

v. Recklinghausen was in places able to make out a definite arrangement of the muscle around the glands. He believes that the growth of the glands and of the muscle go hand in hand. I was unable to detect any special relation of the muscle to the glands. In both cases it looked as if the mucosa had penetrated into the spaces between the muscle bundles. I am constrained to believe that the muscular growth commenced in the inner zone just beneath the mucosa, and that the bundles of these fibres have been loosely united with one another and have allowed the uterine glands to penetrate into the depth.

SUBSEQUENT HISTORY, CHANGES IN THE DIFFUSE ADENO-MYOMATA.

In Case I the uterine mucosa of the anterior wall near the internal os was gathered up into longitudinal folds, and projecting from the lower segment of the uterus was a globular polyp consisting of muscle and glands.

Schatz reports a case which appears to have a definite bearing on the subject. The hardened uterus was 16 cm. long, 8.5 cm. in diameter. Its walls varied from 2 to 2.5 cm. in thickness. The

uterine cavity contained five rows of broad-based polypi. Each row consisted of from two to six polypi. Between the rows were deep depressions. The polypi pointed toward the internal os. They varied from a pea to a hen's egg in size. The uterine cavity was completely filled with them.

On section the polypi were found to have a rich blood supply, and in several places bundles of muscle fibres could be seen extending into them, reaching almost to the free surface. Where the muscular element predominated the polypi were very firm. Scattered throughout the uterine wall were small myomata which were not easily shelled out. In the myomata near the peritoneal surface no cysts were to be seen, but in those near the uterine cavity, and also in the muscle, they were present. The outer portion of the uterine wall was entirely free from cysts. The polypi consisted of spindle-shaped cells, and scattered throughout them were gland-like cavities lined by high cylindrical epithelium. Where dilated, the gland epithelium was cuboidal. The spindle-shaped cells of the polypi merged imperceptibly into the muscle fibres. There was no evidence of carcinoma.

It would appear that in this case there had been a diffuse adeno-myoma and that the uterus was trying to free itself of the new growth in the same manner that it extrudes ordinary myomata, accordingly the polypoid condition would naturally result.

The case of Diesterweg also appears to throw some light on our cases. A woman who for three years had had profuse and painful menstruation on examination presented a nodule the size of a hen's egg at the external os. Its surface was somewhat eroded. Its pedicle, which was one inch in thickness, sprang from the uterine cavity. The nodule was composed of concentric layers. Its walls were 1.5 cm. in thickness, and its centre occupied by a large cavity. The inner surface of this cavity presented numerous small depressions, giving an appearance resembling a ventricle. There was also a smaller cavity the size of a cherry. The walls presented the typical appearance of fibro-myoma, and the cavities were lined by cylindrical ciliated epithelium. They were filled with brownish black blood.

Two years later the patient was again admitted on account of profuse menstruation. The uterus was enlarged and admitted a

sound 13 cm. Soon after the administration of ergotin a tumor the size of a man's fist presented at the external os. This was removed and was found to be 9 x 7 x 6 cm. in diameter. It was composed of myomatous tissue, and contained a cyst the size of a walnut. The cyst was lined by cylindrical ciliated epithelium and filled with blood.

Assuming that Schatz's and Diesterweg's cases belong to the same variety of tumors as Cases I and II, we may picture three stages:

I. The diffuse adeno-myoma, as seen in our Cases I and II and in v. Recklinghausen's case D.

II. The polypoid stage, shown in Schatz's case.

III. The gradual expulsion of the polypi, as noted in Diesterweg's case.

We know uterine myomata usually commence in the interstitial layers of the uterus, and in time pass inward toward the uterine cavity or outward toward the peritoneal surface. In the diffuse adeno-myoma is it not equally probable that portions of the growth will in time be separated and forced toward the peritoneal surface? We think that such is the case.

ORIGIN OF THESE TUMORS.

v. Recklinghausen reports a case (IV b) in which the tumor to a great extent resembles our cases. He, however, found a peculiar glandular arrangement. In places several glands opened into a chief canal, and this after passing a short distance became dilated, forming an ampulla. He reviews at length the microscopical appearance of remains of the Wolffian body, and finds such a striking resemblance between these and the glands of the tumor that he concludes that the glands in this case are derivatives of the Wolffian body, notwithstanding the fact that the glands of the tumor reached the surface of the mucosa in several places.

v. Recklinghausen believes that the growth encroached upon the uterine cavity caused partial atrophy of the mucosa and thus allowed the glands of the tumor to open into the uterine cavity. He, however, admits the possibility of these glands being derived from those of the mucosa. I am strongly of the opinion that the various forms of glands described in this case can be readily ex-

plained by the pressure to which they have been subjected by the myomatous growth, and that their uterine origin is much more probable.

In case D, which he reports in his "Nachtrag," the uterine glands opened in many places on the surface of the mucosa. v. Recklinghausen considers that the glands in this case were undoubtedly derived from the uterine glands.

In our two cases the glands of the tumor originated beyond a doubt from those of the uterine mucosa (Plate III*, Fig. 1).

CLINICAL HISTORY.

The cases reported by v. Recklinghausen, Diesterweg, and myself were all between forty and forty-six years of age. All of the married patients have had children, but none within the few years prior to the operation. All of the patients have had painful and profuse menstruation, and the menstrual blood has frequently been clotted. The symptoms manifested are those common to ordinary uterine myomata, and from the clinical history alone one would not be able to detect any symptom peculiar to this special variety of myoma.

TABULATION OF THE CHIEF POINTS IN THE HISTORY OF THE CASES.

Name.	Age.	No. of children.	No. of years since last child.	Age when menses commenced.	Character of menses.
Freund and v. Recklinghausen.	42	8	8	13	Continual loss of blood for fifteen months.
Diesterweg.	40	8	15	Very profuse for three years. Laterly they were watery, then discharge became purulent. Compelled to remain in bed for last six weeks.
Kelly and Cullen. (Case I).	46	Single.	Single.	11	Profuse and painful; clotted blood.
Kelly and Cullen. (Case II).	40	1	16 Miscarriage 11 years ago.	Profuse, painful, clotted blood.

DIAGNOSIS.

From the symptoms one will be able to make a fairly safe diagnosis of myoma, there being an enlarged uterus, with probably some small subperitoneal nodules on its surface. The uterine cavity will be lengthened, and of course in all these cases pregnancy must be excluded. The continual hemorrhage which has existed for years will contraindicate that. As one sees from examining Plate III*, Fig. 1, curetting the uterine cavity would be of no aid in the diagnosis.

TREATMENT.

In the majority of these the case will be looked upon as a simple myoma, and its true character only determined after operation. Should a diagnosis be made, abdominal hysterectomy is indicated. It would be impossible to shell this tumor out of the muscle and still leave the uterus, the two being so intimately united.

PROGNOSIS.

I agree with v. Recklinghausen in considering these non-malignant. The glands are confined to the new growth and do not show the slightest tendency to invade the normal muscle. The gland epithelium is only one layer in thickness and throughout preserves its typical glandular type, in no place tending to proliferate and fill the gland cavity.

It may be mentioned that among all of the adeno-myomata of the uterus observed by v. Recklinghausen there were two in which he thought there was a carcinomatous change. The prognosis is good.

We have reported Case III to show the contrast between it and adeno-myoma uteri diffusum benignum.

In Case III there is likewise a diffuse myomatous thickening of the inner layers of the uterine wall, and in the fundus is a well defined myoma. The uterine mucosa is seen in depressions on either side of a submucous myoma (Plate II*), but the myomatous thickening is in no part invaded by the glandular element of the mucosa.

v. Recklinghausen, in his recent monograph, reports a case (XVIII) which belongs to the same class as our Case III. He concludes that in his case the myomatous growth originated in the inner layers of the uterine muscle, and that it pushed the uterine muscle outward and the mucosa inward. The myomatous mass at various points encroached on the mucosa, causing atrophy; in the spaces between the projections the mucosa extended into the depth. In his case also there were no glands in the myoma.

In conclusion, I wish to thank Prof. Kelly, who has so kindly had the accompanying drawings made for me, and to especially thank my friend Mr. Brödel who has executed them.

DESCRIPTION OF PLATES.

PLATE I*.

THE UTERUS OF CASE I. NATURAL SIZE.

The uterus has been cut open and we are viewing it from the front. The drawing is from the specimen hardened in Müller's fluid. A small portion of the cervix is present. Projecting through the cervical opening is a globular nodule whose pedicle springs from the uterine cavity just within the internal os. On referring to histological examination it will be found to be a myoma everywhere penetrated by glands. The anterior uterine wall is much thicker than usual. It is divisible into two portions: an inner, coarsely striated, and an outer but narrower zone which is the normal uterine muscle. This outer zone presents a parallel arrangement of its muscle bundles. On examining the fundus carefully the coarse striation is seen to be confined to the anterior wall. The uterine mucosa, apart from a slight undulation of the surface, is smooth. The small folds described as occurring near the internal os are obscured by the polyp. One of the most striking features is that there is practically no encroachment of the growth on the uterine cavity, the anterior wall of the cavity showing little, if any, convexity. This is in marked contrast to what is seen in submucous myomata.

PLATE II*.

CASE III. NATURAL SIZE.

The uterus has been hardened in Müller's fluid and then divided longitudinally. To the left is the lower portion of the anterior uterine wall, the upper part having been cut away. The anterior wall presents little, if any, thickening, and its mucosa is of the usual thickness. The posterior wall is greatly thickened; it is divisible into two zones: an inner, presenting the appearance of an ill-defined myoma; and an outer, consisting of uterine muscle. This thickened portion is continuous with the myoma occupying the fundus. There is a diffuse thickening with certain definite myomatous foci. The outer covering is composed of normal uterine muscle. Attached to the posterior surface of the uterus are dense adhesions. The mucosa of the posterior wall near the internal os presents a slightly wavy outline, but is normal in thickness. As one passes upward it becomes much thicker and its glands are seen to be cystic.

Near the fundus the mucosa dips deeply down into depressions on either side of a myomatous nodule. At the point where the anterior wall comes in contact with the posterior wall the mucosa of the latter shows a dome-like elevation.

PLATE III*.

Fig. 1 is a cross section from the thickened anterior uterine wall of case I (see Plate I*). It is four times enlarged. To the left is the uterine mucosa, the surface of which presents a wavy outline. The surface epithelium is intact, and the glands are for the most part normal in size. A few of them are dilated, one reaching a considerable size. On passing toward the right, large numbers of longitudinal glands are seen penetrating downward into the growth between the muscle bundles. These are surrounded by a tissue that is darker than the muscle. This is the typical stroma of the mucosa. The greater part of the specimen is composed of bundles of muscle fibres. Some of the bundles present a circular arrangement, others are oblong, and some wind in and out in all directions. These large bundles are again subdivided into smaller ones.

Scattered everywhere throughout the thickened zone are dark

areas; some of these are triangular, some are half-moon-shaped, others are irregular in shape. On examining these areas closely the majority are found to contain longitudinal or cross sections of glands. Some of these glands are dilated and irregular in contour. A longitudinal section of a gland with a dilatation on one side is seen near the junction of the myomatous zone with the uterine muscle.

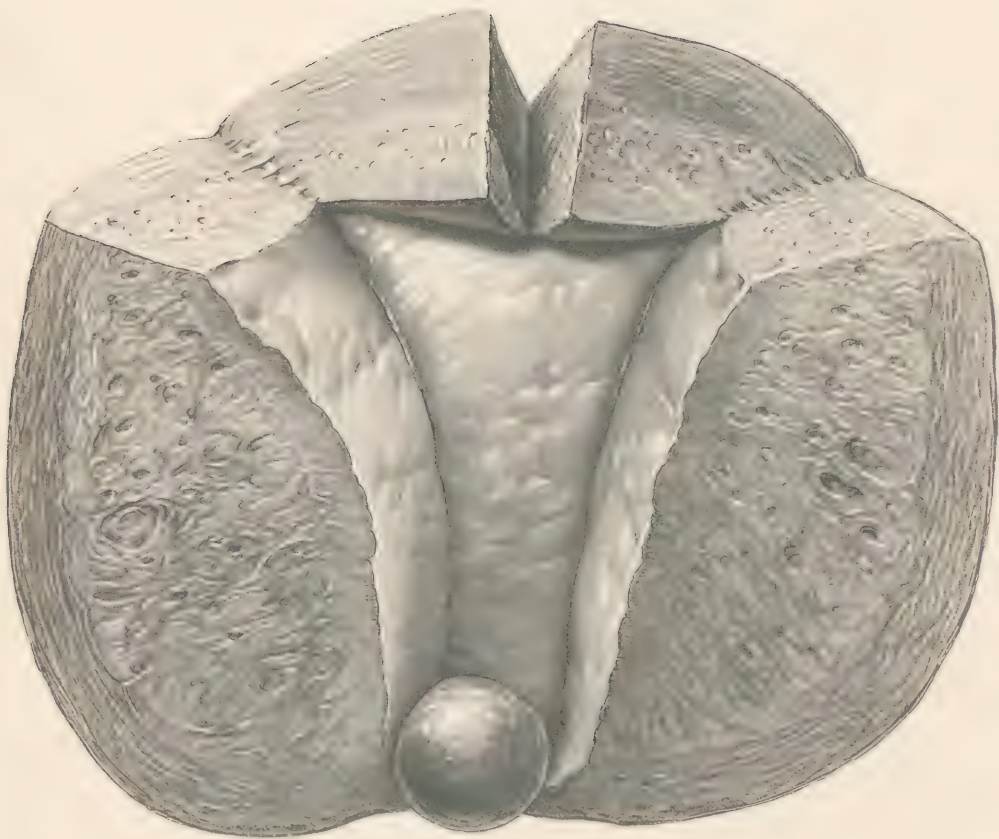
The large clear spaces scattered throughout the myomatous zone are dilated glands. Here and there a dark patch is seen in which no glands are present. There are islands of stroma devoid of glands. The glandular elements diminish in number in the outer portions of the growth, and at the point where the uterine muscle commences are absent.

The outer zone, consisting of uterine muscle, presents the appearance of normal muscle.

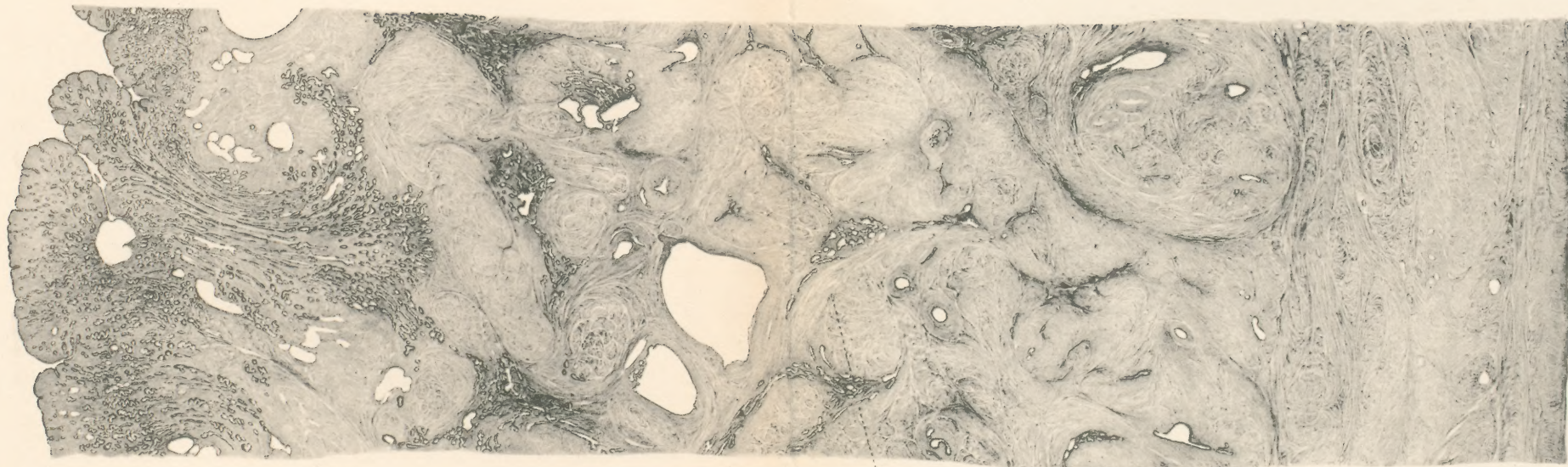
Fig. 2 ($\times 200$) is a cross section of a gland taken from Fig. 1 at *a*. The gland is lined by one layer of cylindrical epithelium, and is surrounded by cells having oval vesicular nuclei. It resembles identically a normal uterine gland. Surrounding the stroma of the gland are non-striped muscle fibres, the majority of which are cut longitudinally.

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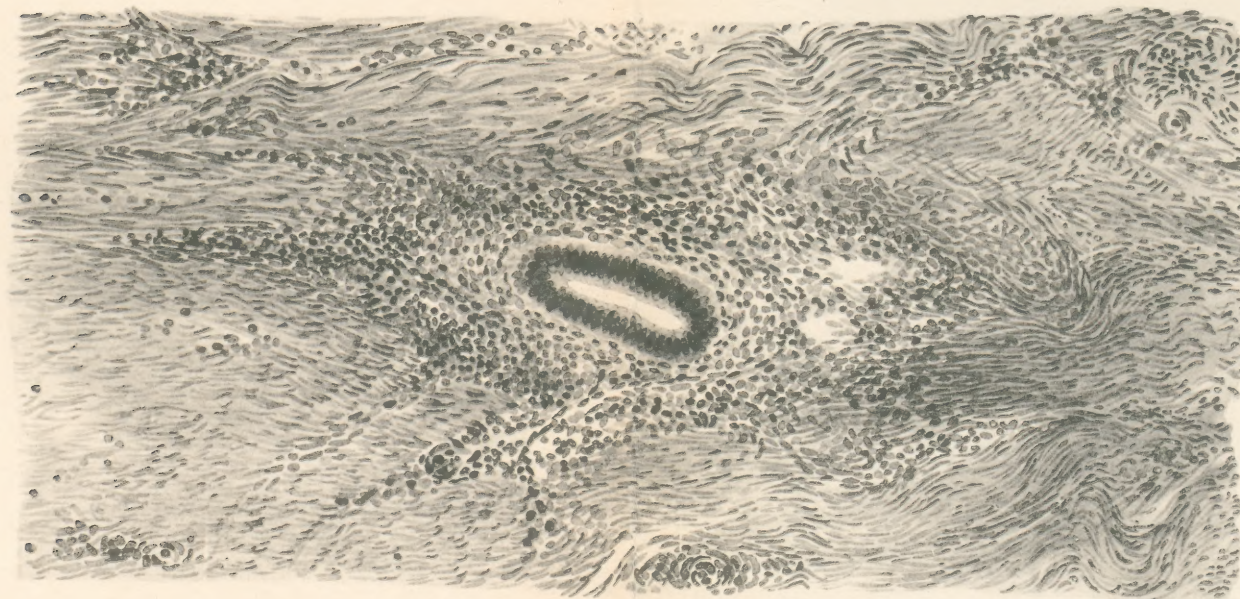


Uterine mucosa.

Tumor consisting of myomatous muscle and glands.

Normal uterine muscle.

Fig. 1.



Max Brödel, fec.

Fig. 2.

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